

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application. Please amend the claims as follows:

Listing of Claims:

1. (Currently Amended) Method for inputting ~~information~~ an information element from an information element set in an information processing device having a multiple axes input key movable in M multi-axial directions, said method comprising the acts of:

moving the key in one of the M multi-axial directions to generate a selection stroke;

repeating said act of moving the key N number of times to generate N selection strokes, a pattern of N selection strokes with each stroke being in one of M multi-axial directions defining the information to be input to the information processing device; and

wherein the number of selection strokes N is given by a logarithmic value of a number of information elements in the information element set to a base M where M is the number of directional strokes available from the multiple axes input key.

2. (Currently Amended) The method of claim 1 wherein each act of moving comprises:

providing a selected subset of information elements from ~~a set of the~~ information element set choices existing prior to the act of moving.

3. The method of claim 2 wherein the Nth stroke of the input key provides a final selected subset of information to be input to the information processing device.

4. (Currently Amended) The method of claim 3 wherein the ~~set of~~ information element set is a set of characters.

5. The method of claim 4 wherein the information processing device has a display screen to display the final selected subset of information as a character.

6. The method of claim 4 wherein the set of characters are alphabetic characters.

7. The method of claim 4 wherein the set of characters are numeric characters.

8. (Currently Amended) The method of claim 2 wherein the information processing device has a display screen to display each subset of information elements after each stroke of the input key.

9. (Currently Amended) A method for interpreting a sequence of input strokes by a multiple axes input key to input an information element into a computing system, said method comprising:

- drawing a display of the selectable information element set in a pattern illustrating input key stroke directions for selecting subsets of the selectable information element set with the input key;
- detecting a multi-axial key stroke direction from movement of the input key;
- identifying from the key stroke direction a selected subset of the selectable information element set;
- repeating the detecting action and identifying action for a predetermined number of strokes N by the input key so that the identifying step after the last stroke of the input key identifies a selected information element to be loaded into the computing system; and

wherein the predetermined number of strokes N is given by a logarithmic value of a number of the selectable information elements in the selectable information element set to a base M where M is a number of directional strokes available from the input key.

10. The method of claim 9 further comprises:

- loading the selected information element into a user input string for the computing system.

11. Deleted

12. (Currently Amended) The method of claim 11 wherein M equals the number of axes of the input key multiplied by the number of detectable stroke directions in each axis to define the number of directional movements available with the input key.

13. The method of claim 12 wherein said detecting action comprises:

- detecting a stroke direction by detecting actuation of a switch along an axis of the input key.

14. The method of claim 9 further comprises:

- updating the display, after the identifying action, to display the selected subset of the information element set identified by the identifying action whereby a user is guided to the next choices available through the input key.

15. (Currently Amended) A user interface method in a computing system for inputting a plurality of information elements through a single input device capable of multiple axes strokes, said interface method comprising:

- entering a multi-axial directional stroke with the input device to select a subset of information elements to be selected;
- repeating said entering step for a predetermined number of times strokes N until an a

desired information element is selected and where the predetermined number of strokes N is identical for each input of a selected information element; and

wherein the predetermined number of strokes N is given by a logarithmic value of the number of the information elements in an information element set to a base M where M is a number of directional strokes available from the input device.

16. The method of claim 15 further comprises:

displaying an information element set of selectable elements for input into the computing system to illustrate subsets of information elements selectable with each directional stroke.

17. The interface method of claim 15 further comprises:

updating the subset of information elements displayed by said displaying action based on the directional stroke entered by the entering action.

18. The interface method of claim 16 wherein the displaying action displays the information elements arranged in a pattern to provide guidance as to what subsets of informational elements will be selected by the next directional stroke.

19. The interface method of claim 15 wherein the displaying action displays the information elements arranged in a pattern to provide guidance as to what subsets of informational elements will be selected by the each directional stroke.

20. (Currently Amended) A computing system for interpreting directional strokes from a multiple axis input button to enter information into the computing system, said computing system comprising:

a display processor drawing a display page for a display screen, the display page containing information elements arranged in a pattern to guide selection of information elements by directional strokes of the input button;

an input adapter detecting multi-axial directional strokes by the input button;

a stroke processor identifying an information element for entry in the computing system, the information element identified based on a sequence of multi-axial directional strokes N detected by the adapter, the number of strokes in a sequence being the same for all information elements; and

wherein the number of strokes in a sequence to select an information element is given by the expression $N = \log_{(M)} E$ where N is the number of strokes, M is the number of possible directions for each stroke of the input button, and E is the number of information elements in an information element set from which a desired information element is selected.

21. (Currently Amended) The computing system of claim 20 wherein the stroke processor comprises:

information elements array storing the information elements as a hierarchy with a level of the hierarchy associated with each stroke;

a select array storing the direction of each stroke at a select level associated with each stroke; and

the stroke processor combining information from the information elements array and the select array to identify a selected information element.

22. (Currently Amended) The computing system of claim 21 wherein:

the stroke processor combines information from the information elements array and the select array after each detected stroke to identify a subset of selected information elements; and

the display processor displays the subset of selected information elements after each detected stroke to provide a guide in the selection of information elements or element by the next stroke.

23. Deleted.

24. (Currently Amended) The computing system of claim 2320 where the number of information elements E is sixty four graphical or character keys, the number of possible directions for each stroke is four and the number of strokes N in a sequence is 3.

25. (Currently Amended) The computing system of claim 2320 where the number of information elements E is sixteen graphical or character keys, the number of possible directions for each stroke is four and the number of strokes N in a sequence is 2.

26. (Currently Amended) A computer readable medium readable by a computer and encoding instructions for executing a computer process for interpreting a sequence of input strokes by a multi-directional input key to input an information element into a computing system, said method comprising:

drawing a display of the selectable information element set in a pattern illustrating input key stroke directions for selecting subsets of the selectable information element set with the input key;

detecting a key stroke direction from movement of the input key;

identifying from the key stroke direction a selected subset of the selectable information element set;

repeating the detecting action and identifying action for a predetermined number of strokes N by the input key so that the identifying step after the last stroke of the input key identifies a selected information element to be loaded into the computing system; and

wherein the predetermined number of strokes N is given by a logarithmic value of a number of the selectable information elements in the selectable information element set to a base M where M is a number of directional strokes available from the input key.

27. The computer process in the computer readable medium of claim 26 further comprises:
loading the selected information element into a user input string for the computing system.
28. The computer process in the computer readable medium of claim 26 wherein the predetermined number of strokes N is given by the logarithmic value of the number of the information elements in the information element set to a base M where M is the number of directional strokes available from the input key.
29. The computer process in the computer readable medium of claim 28 wherein M equals the number of axes of the input key multiplied by the number of detectable stroke directions in each axis to define the number of directional movements available with the input key.
30. The computer process in the computer readable medium of claim 29 wherein said detecting action comprises:
detecting a stroke direction by detecting actuation of a switch along an axis of the input key.
31. The computer process in the computer readable medium of claim 26 further comprises:
updating the display, after the identifying action, to display the selected subset of the information element set identified by the identifying action whereby the a user is guided to the next choices available through the input key.
32. (Currently Amended) A computer readable medium readable by a computer and encoding instructions for executing a computer process for interpreting directional strokes from a multiple axes input button to enter information into a computing system, said computer process comprising:
drawing a display page for a display screen, the display page containing information elements arranged in a pattern to guide selection of information elements by directional strokes of the input button;
detecting multi-axial directional strokes by the input button; and
identifying an information element for entry in the computing system, the information element identified based on a sequence of directional strokes detected by the adapter; and

wherein the number of strokes in a sequence to select an information element is given by the expression $N = \log_{(M)} E$ where N is the number of strokes, M is the number of possible directions for each stroke of the input button, and E is the number of information elements in an information element set from which a desired information element is selected.

33. The computer process in the computer readable medium of claim 32 wherein the identifying action comprises:

storing the information elements in an information elements array as a hierarchy with a level of the hierarchy associated with each stroke;

storing the direction of each stroke in a select array at a select level associated with each stroke; and

combining information from the information elements array and the select array to identify a selected information element.

34. The computer process in the computer readable medium of claim 33 wherein:

the combining action combines information from the information elements array and the select array after each detected stroke to identify a subset of selected information elements; and

the displaying action displays the subset of selected information after each detected stroke to provide a guide in the selection of information elements or element by the next stroke.

35. The computer process in the computer readable medium of claim 32 wherein the number of strokes in a sequence is the same for all information elements.

36. Deleted

37. (Currently Amended) The computer process in the computer readable medium of claim 3632 where the number of information elements E is sixty four graphical or character keys, the number of possible directions for each stroke is four and the number of strokes N in a sequence is 3.

38. (Currently Amended) The computer process in the computer readable medium of claim 3632 where the number of information elements E is sixteen graphical or character keys, the number of possible